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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/534,696	03/24/2000	William L. Betts	61607-1350	2506

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EXAMINER

HA, DAC V

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/534,696

Applicant(s)

BETTS, WILLIAM L.

Examiner

Dac V. Ha

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) 26-52 and 54 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-7 and 53 is/are allowed.
- 6) ☒ Claim(s) 8-10, 13-19 and 21-25 is/are rejected.
- 7) ☒ Claim(s) 11, 12 and 20 is/are objected to.
- 8) ☒ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the Response To Restriction Requirement filed on 08/04/03, in which applicant has elected to prosecute the claims in Group I (claims 1-25, 53) without traverse.

Claim Objections

2. **Claims 8-25** are objected to because of the following informalities:

Claim 8:

Lines 3-4, the recitation "said convolutionally encoded data streams" should be changed to "the convolutionally encode data streams" to correct the antecedent basis requirement.

Similarly for the recitation "said interleaved convolutionally-encoded data streams" on line 5.

Claim 17:

Similar problem (as that in claim 8) exists on lines 4, 5.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claim 21** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. **Claim 21** recites the limitation "said first and second outputs" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 8-10, 13, 17-19, 22** are rejected under 35 U.S.C. 102(b) as being anticipated by Shramm (US 5,812,601).

Regarding claim 8, Shramm teaches the following claimed subject matter.

"means for convolutionally encoding each data streams of a plurality" (Figure 8, elements Encoder 0 – Encoder 3; Col. 3, lines 36-38);

"means for interleaving data segments from said convolutionally encoded data streams" (Figure 8, elements Interleaver 0 – Interleaver 3);

"means for communicating said interleaved convolutionally-encoded data streams to a plurality of separate communication paths" (Figure 8, elements Mapping; Figure 1, element 105).

Regarding claim 17, see claim 8 above.

Regarding claim 9, Shramm further teaches the claimed subject matter "first and second pluralities of convolutional encoding means for convolutionally encoding first and second data streams, respectively, so that each of said communicated data

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streams comprise data segments from each of said convolutional encoding means" in Encoder 0 – Encoder 3; Col. 3.

Regarding claim 10, Shramm further teaches the claimed subject matter "said convolutional encoding means is a single convolutional encoder designed to process and encode said plurality of data streams" in Figure 4, element 401.

Regarding claim 13, Shramm further teaches the claimed subject matter "wherein said convolutional encoding means performs trellis encoding" in Col. 3, line 18.

Regarding claim 18, Shramm further teaches the claimed subject matter "the step of convolutionally encoding said plurality of said data streams with greater than two convolutional encoders so that said transmitted data streams comprise data segments from each of said greater than two convolutional encoders" in Figure 8, elements Encoder 0 – Encoder 3.

Regarding claims 19, 22, see claims 10, 13 above, respectively.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claims 14, 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shramm.

Regarding claim 14, Shramm teaches all the claimed subject matter in claim 14, as applied to claim 8 above, except for the claimed subject matter "said separate communication paths are each wire pairs". However, a person of ordinary skill in the art would have understood that the communication channel (Figure 1, element 105) in Shramm could be free space, telephone line, etc. Therefore, this claimed subject matter would have been optional to one skilled in the art as optional.

Regarding claim 23, see claim 14 above.

10. **Claims 15, 16, 21, 24, 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shramm in view of Ramesh (US 6,131,180).

Regarding claim 15, Shramm teaches all the claimed subject matter in claim 14, as applied to claim 8 above, except for the claimed subject matter "wherein said convolutional encoding means is implemented with software that is executed with a processing means".

The attention is now directed to Ramesh, which teaches a software encoder utilizing a processor in Figure 8; Col. 3, lines 3-4; Col. 7, line 42.

Therefore, a person of ordinary skill in the art at the time of the invention would have motivated to use a software encoder, as taught by Ramesh, for the encoder in Shramm since utilizing software would provide more flexibility to the system and a "processing means" (i.e. DSP) is a state of the art and is widely used.

Regarding claim 24, see claim 15 above.

Regarding claim 16, Ramesh further suggests the teaching of the claimed subject matter "means for independently defining data rates on said paths by separately

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defining a number of bits for each of said interleaved data segments" in Col. 3, lines 41-49; Col. 4, lines 41-44; Col. 1, line 63 to Col. 2, line 6; Col. 6, lines 13-20, in that the communication paths dictates the constellation selection and consequently the coding rates.

Regarding claims 21, 25, see claim 16 above.

Allowable Subject Matter

11. **Claims 1-7, 53** are allowed.

12. **Claims 11, 12, 20** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior art of record, taking individually or collectively, fails to suggest the motivation for incorporate in an apparatus and method, as claimed, the claimed subject matter "a switch designed to perform the following alternatively during successive baud periods:

(1) connect said first input to said first output through said first convolutional encoder while connecting said second input of said second output though said second convolutional encoder during said baud period; and

(2) connect said first input to said second output though said first convolutional encoder while connecting said second input to said first output through said second convolutional encoder" in claim 1 and similarly in claims 11, 20, 53. Therefore, claims 1-7, 11-12, 20, 53 are found to be novel and unobvious over prior art of record.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chen et al. (US 6,445,750) disclose a Technique For Communicating Digitally Modulated Signals Over An Amplitude-Modulation Frequency Band.

Gelblum et al. (US 6,088,387) disclose a Multi-Channel Parallel/Serial Concatenated Convolutional Codes And Trellis Coded Modulation Encoder/Decoder.

Takaki (US 5,638,408) discloses a Variable Transmission Rate Discrimination Method And Apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dac V. Ha whose telephone number is 703-306-5536. The examiner can normally be reached on 5/4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 305-5500.

A handwritten signature in black ink, appearing to read 'Dac V. Ha', with a horizontal line underneath it.

Dac V. Ha
Examiner
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